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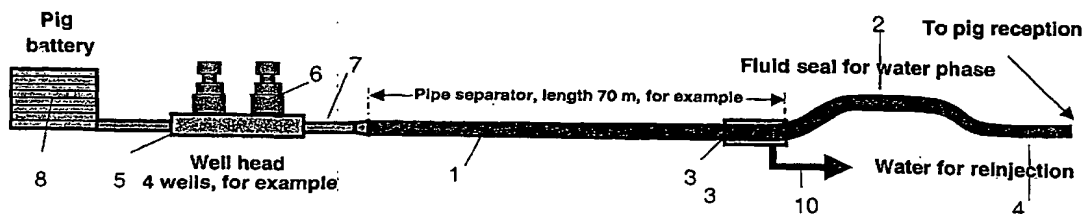
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- Published:**
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(54) Title: A PIPE SEPARATOR FOR THE SEPARATION OF FLUIDS, PARTICULARLY OIL, GAS AND WATER



(57) Abstract: A pipe separator for the separation of fluids, for example separation of oil, gas and water in connection with the extraction and production of oil and gas from formations beneath the sea bed, comprising a pipe-shaped separator body (1) with an inlet and outlet that principally corresponds to the transport pipe (4, 7) to which the pipe separator is connected. The special feature of this solution is that a pipe bend or loop (2) is arranged in the pipe separator (1) or in connection with its outlet to form a downstream fluid seal in relation to the pipe separator (1), which is designed to maintain a fluid level in the pipe separator, but which also allows the pipe separator (1) and the loop (2) to be pigged.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/NO 03/00265

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: E21B 43/36, B01D 17/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: E21B, B01D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0331295 A1 (NORSK HYDRO A.S.), 6 Sept 1989 (06.09.89) --	1-4
A	US 4705114 A (W.W. SCHROEDER ET AL), 10 November 1987 (10.11.87) --	1-4
A	GB 2239193 A (W.D. BLENKINSOP), 26 June 1991 (26.06.91) -----	1-4

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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INTERNATIONAL SEARCH REPORT
Information on patent family members

06/09/03

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Patent document cited in search report			Publication date	Patent family member(s)		Publication date
EP	0331295	A1	06/09/89	BR	8900411 A	26/09/89
				DE	68903771 D,T	13/05/93
				ES	2036339 T	16/05/93
				NO	163424 B,C	12/02/90
				NO	880465 A	04/08/89

US	4705114	A	10/11/87	BR	8603337 A	24/02/87
				CA	1258620 A	22/08/89
				CN	86104803 A	14/01/87
				DE	3622995 A	12/02/87
				DK	334586 A	16/01/87
				GB	2177739 A,B	28/01/87
				GB	8517760 D	00/00/00
				NL	8601726 A	02/02/87
				NO	862846 A	16/01/87

GB	2239193	A	26/06/91	GB	8928659 D	00/00/00
